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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/659,494	09/10/2003	Ryutaro Kusunoki	03531/LH	3447
1933	7590	12/01/2004	EXAMINER	
FRISHAUF, HOLTZ, GOODMAN & CHICK, PC 767 THIRD AVENUE 25TH FLOOR NEW YORK, NY 10017-2023			STEPHENS, JUANITA DIONNE	
			ART UNIT	PAPER NUMBER
			2853	

DATE MAILED: 12/01/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/659,494	Applicant(s) KUSUNOKI, RYUTARO	
	Examiner Juanita D. Stephens	Art Unit 2853	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on Application filed 9/10/03.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☐ Claim(s) 1-6 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-6 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 29 December 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Priority

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Specification

2. The disclosure is objected to because of the following informalities:

In the detailed description of the preferred embodiment the Figure numbers should correspond with the actual Figures, for example, page 11, line 3 replace "Fig. 3" with Figs. 3A and 3B. Applicant is behooved to review the specification and make the necessary changes.

On page 14, line 10 replace "processing" with --process--.

Appropriate correction is required.

The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

Drawings

3. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference character(s) not mentioned in the description: Reference letters "G" and "m". Corrected drawing sheets in compliance with 37 CFR 1.121(d), or amendment to the specification to add the reference character(s) in the description in compliance with 37 CFR 1.121(b) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version

of the sheet, even if only one figure is being amended. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Objections

4. Claims 1-6 are objected to because of the following informalities:

In claim 1, line 13 replace "the ink ejecting side" with --an ink ejecting side--.

In claim 2, line 3 replace "the external side" with --the ink ejecting side--.

In claim 4, line 11 replace "the ink ejecting side" with --an ink ejecting side--.

In claim 5, line 4 the word "ejecting" is misspelled.

Appropriate correction is required.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claim 1 are rejected under 35 U.S.C. 103(a) as being unpatentable over Usui et al. (US 5,748,214) in view of Ogasawara et al. (US 5,975,681).

Usui et al. discloses an inkjet head (Fig. 1) comprising: 1) a plurality of pressure chambers (pressure producing chambers 51 and 71) arranged in parallel (Fig. 13), each of which communicates with an ink supplying path (ink supply communication paths 58

and 78), each chamber being defined by side walls, wherein the plurality of pressures chambers comprise a printing region (region where chambers 51 are located)(col 10, ln 66-col 11, ln 3; Fig. 13) and a non-printing region (region E where chamber 71 is located)(col 10, lns 61-66; Fig. 13), 2) an ejecting nozzle (66) provided at one end of the pressure chamber in the printing region (col 12, lns 12-17), 3) pressure means (53) for varying a capacity in the pressure chamber according to a driving signal (col 12, lns 22-28), 4) a dummy nozzle (79) provided at one end of the pressure chamber (pressure producing chambers 71) in the non-printing region (col 12, lns 12-17), and 5) a head driving means that selectively varies the capacity in the pressure chamber by applying the driving signal to the pressure means, to eject ink from the ejecting nozzle, wherein, when selectively varying the capacity in the pressure chamber positioned at an end of the printing region, the head driving means selectively varies the capacity in the pressure chamber in the non-printing region simultaneously (inherent teaches).

Usui et al. does not disclose 1) wherein the dummy nozzle has a shape set to have an aperture area at the ink ejecting side greater than an aperture area of the ejecting nozzle and to have a flow impedance same as that of the ejecting nozzle. Ogasawara et al. at least teaches wherein the dummy nozzle has a shape set to have an aperture area at the ink ejecting side greater than an aperture area of the ejecting nozzle and to have a flow impedance same as that of the ejecting nozzle (col 9, lns 3-7). It would have been obvious at the time the invention was made to a person having ordinary skill in the ink jet art to modify Usui et al. with the nozzle structure at taught to

be old by Ogasawara et al. for the purpose of lowering the occurrence frequency of an image defect due to air bubbles and improving the ink utilization efficiency.

7. Claims 2 and 3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Usui et al. (US 5,748,214) in view of Ogasawara et al. (US 5,975,681) as applied to claim 1 above, and further in view of Takata et al. (US 6,142,607).

Usui et al. in view of Ogasawara et al. are discussed above. Usui et al. in view of Ogasawara et al. does not disclose 1) wherein the aperture diameter of the ejecting nozzle at the side of the pressure chamber is set greater than an aperture diameter at the external side, while an aperture diameter of the dummy nozzle at the side of the pressure chamber is set smaller than an aperture diameter at the ink ejecting side, and 2) wherein the ejecting nozzle and the dummy nozzle are formed to have a symmetrical shape with respect to the ejecting direction of an ink droplet. Takata et al. at least teaches wherein the aperture diameter (d2) of the first nozzle (28b) at the side of the pressure chamber is set greater than an aperture diameter (d1) at the external side, while an aperture diameter (d1) of the second nozzle (28a) at the side of the pressure chamber is set smaller than an aperture diameter (d2) at the ink ejecting side, and wherein the first and second nozzles are formed to have a symmetrical shape with respect to the ejecting direction of an ink droplet (col 9, lns 22-52; Fig. 15). It would have been further obvious at the time the invention was made to person having ordinary skill in the ink jet art to modify Usui et al. in view of Ogasawara et al. with the nozzle structure at taught to be old by Takata et al. for the purpose of simplifying the machining

process for forming the nozzles, which results in an increased productivity and an inexpensive product.

8. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Usui et al. (US 5,748,214) in view of Ogasawara et al. (US 5,975,681) and Osada et al. (US 6,431,682 B1).

Usui et al. discloses an inkjet head (Fig. 1) comprising: 1) a plurality of pressure chambers (pressure producing chambers 51 and 71) arranged in parallel (Fig. 13), each of which communicates with an ink supplying path (ink supply communication paths 58 and 78), each chamber being defined by side walls, wherein the plurality of pressure chambers comprise a printing region (region where chambers 51 are located)(col 10, ln 66-col 11, ln 3; Fig. 13) and a non-printing region (region E where chamber 71 is located)(col 10, lns 61-66; Fig. 13), 2) an ejecting nozzle (66) provided at one end of the pressure chamber in the printing region (col 12, lns 12-17), 3) pressure means (53) for varying a capacity in the pressure chamber according to a driving signal (col 12, lns 22-28), 4) a dummy nozzle (79) provided at one end of the pressure chamber (pressure producing chambers 71) in the non-printing region (col 12, lns 12-17), 5) a head driving means that selectively varies the capacity in the pressure chamber by applying the driving signal to the pressure means, to eject ink from the ejecting nozzle, wherein, when selectively varying the capacity in the pressure chamber positioned at an end of the printing region, the head driving means selectively varies the capacity in the pressure chamber in the non-printing region simultaneously (inherent feature), and 6)

Art Unit: 2853

drive control means for driving the pressure chambers and the head driving means based upon a driving signal in accordance with image data (inherent feature).

Usui et al. does not disclose 1) an ink jet printer, 2) the dummy nozzle has a shape set to have an aperture area at the ink ejecting side greater than an aperture area of the ejecting nozzle and to have a flow impedance same as that of the ejecting nozzle, and 3) moving means that relatively moves the inkjet head and a recording medium such that the recording medium passes a print position opposite to the ejecting nozzle. Ogasawara et al. at least teaches the use of an ink jet print head used in an ink jet printer (col 1, lns 13-20), wherein the dummy nozzle has a shape set to have an aperture area at the ink ejecting side greater than an aperture area of the ejecting nozzle and to have a flow impedance same as that of the ejecting nozzle (col 9, lns 3-7). It would have been obvious at the time the invention was made to a person having ordinary skill in the ink jet art to modify Usui et al. with the nozzle structure at taught to be old by Ogasawara et al. for the purpose of lowering the occurrence frequency of an image defect due to air bubbles and improving the ink utilization efficiency. Osada et al. at least teaches a moving means (carriage 305 and paper sending motor 209) that relatively moves the inkjet head and a recording medium (230) such that the recording medium passes a print position opposite to the ejecting nozzle (col 13, lns 16-38). It would have been obvious at the time the invention was made to a person having ordinary skill in the ink jet art to modify Usui et al. with the moving means at taught to be old by Osada et al. for the purpose of moving the inkjet printhead relative to the recording medium.

9. Claims 5 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Usui et al. (US 5,748,214) in view of Ogasawara et al. (US 5,975,681) and Osada et al. (US 6,431,682 B1) as applied to claim 4 above, and further in view of Takata et al. (US 6,142,607).

Usui et al. in view of Ogasawara et al. and Osada et al. are discussed above. Usui et al. in view of Ogasawara et al. and Osada et al. does not disclose 1) wherein the aperture diameter of the ejecting nozzle at the side of the pressure chamber is set greater than an aperture diameter at the external side, while an aperture diameter of the dummy nozzle at the side of the pressure chamber is set smaller than an aperture diameter at the ink ejecting side, and 2) wherein the ejecting nozzle and the dummy nozzle are formed to have a symmetrical shape with respect to the ejecting direction of an ink droplet. Takata et al. at least teaches wherein the aperture diameter (d2) of the first nozzle (28b) at the side of the pressure chamber is set greater than an aperture diameter (d1) at the ejecting side, while an aperture diameter (d1) of the second nozzle (28a) at the side of the pressure chamber is set smaller than an aperture diameter (d2) at the ink ejecting side, and wherein the first and second nozzles are formed to have a symmetrical shape with respect to the ejecting direction of an ink droplet (col 9, lns 22-52; Fig. 15). It would have been further obvious at the time the invention was made to person having ordinary skill in the ink jet art to modify Usui et al. in view of Ogasawara et al. and Osada et al. with the nozzle structure at taught to be old by Takata et al. for the purpose of simplifying the machining process for forming the nozzles, which results in an increased productivity and an inexpensive product.

Contact Information

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Juanita D. Stephens whose telephone number is (571) 272-2153. The examiner can normally be reached on Flex.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Meier can be reached on (571) 272-2149. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Juanita D. Stephens
Primary Examiner
Art Unit 2853

November 28, 2004